Appendix A

Community Health Risk Assessment

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16601 ALMADEN DAYCARE PROJECT
San Jose, California

COMMUNITY HEALTH RISK ASSESSMENT

January 6, 2016

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Introduction

The purpose of this report is to address community health risk impacts associated with a proposed daycare facility to be located at 16601 Almaden Expressway in the City of San Jose. The proposed project would be located at the southwest corner of the Almaden Expressway/Redmond Avenue intersection. The daycare facility would operate from 6:30 a.m. to 6:30 p.m. Monday through Friday, serving children ranging from infancy to 12 years of age. Figure 1 shows the project site and surrounding area. The new daycare facility would be between 30 feet and 140 feet from the edge of Almaden Expressway. Traffic on Almaden Expressway is a source of toxic air contaminants (TACs) that could adversely affect children at the proposed daycare facility. This assessment was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD) and the State of California Office of Environmental Health Hazard Assessment (OEHHA) to analyze potential community health risk impacts at the project site from nearby sources of TAC emissions.

Setting

The project is located in the City of San Jose, which is in the San Francisco Bay Area Air Basin. The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, the California Air Resources Board (CARB) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published CEQA Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.[1]

Toxic air contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer). TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and Federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the CARB, diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the state's Proposition 65 or under the Federal Hazardous Air Pollutants programs. For purposes of evaluating health risks from combustion of diesel fuels in internal combustion engines, combustion formed fine particulate matter ($PM_{2.5}$) is considered to be diesel particulate matter (DPM) and is used to represent all particulate and gaseous compounds of diesel combustion related emissions. This procedure is consistent with BAAQMD guidance.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.[2] The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or newer by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

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[1] Bay Area Air Quality Management District. 2011. BAAQMD CEQA Air Quality Guidelines. May.
[2] Available online: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: infants and children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The project would include a daycare facility with infants and children that would be considered sensitive receptors with exposure to air pollutant sources, such as traffic on Almaden Expressway and nearby stationary sources.

Community Risk Thresholds of Significance

The BAAQMD identified significance thresholds for exposure to TACs and $PM_{2.5}$ as part of its May 2011 California Environmental Quality Act (CEQA) Air Quality Guidelines that were recently vacated by the court action.[3] This analysis considers the science informing the thresholds as being supported by substantial evidence. The Guidelines include thresholds to evaluate single source and cumulative source impacts of TACs and $PM_{2.5}$ on existing sensitive receptors and proposed sensitive receptors. The single source impact thresholds are based on BAAQMD Risk Management Policy and are currently used by BAAQMD to evaluate impacts from new air pollution sources. The cumulative community risk thresholds that were identified by BAAQMD are the only thresholds of this kind. Therefore, these thresholds are used to evaluate impacts from this project. The following are the significance criteria that are used to judge this project's impacts:

Single Source Impacts

If emissions of TACs or $PM_{2.5}$ exceed any of the thresholds of significance listed below, the proposed project would result in a significant impact and mitigation would be required:

- An excess cancer risk level of more than 10.0 in one million, or a non-cancer (chronic or acute) hazard index greater than 1.0.
- An incremental increase of more than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$.

Cumulative Source Impacts

A project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius of the fence line of a source or from the location of a receptor, plus the contribution from the project, exceeds the following thresholds:

- An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0.
- 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.

[3] The Bay Area Air Quality Management District's (BAAQMD) adoption of its 2011 thresholds was called into question by an order issued March 5, 2012, in California Building Industry Association v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The claims made in the case concerned the environmental impacts of adopting the thresholds, that is, how the thresholds would indirectly affect land use development patterns. Those issues are not relevant to the scientific basis of BAAQMD's analysis of what levels of pollutants should be deemed significant. This analysis considers the science informing the thresholds as being supported by substantial evidence. Scientific information supporting the thresholds was documented in BAAQMD's proposed thresholds of significance analysis.

TAC Sources Considered and their Impacts

Project impacts related to increased community risk can occur either by introducing a new sensitive receptor, such as a residential use, in proximity to an existing source of TACs or by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity. The BAAQMD recommends using a 1,000-foot screening radius around a project site for purposes of identifying community health risk from siting a new sensitive receptor or a new source of TACs. Operation of the proposed daycare facility is not considered a source of TAC or $PM_{2.5}$ emissions. As a result, the project operation would not cause emissions that expose sensitive receptors to unhealthy air pollutant levels. The proposed project would introduce new sensitive receptors, infants and children at the daycare facility, to the area that would be exposed to emissions from nearby roadways and stationary sources. These impacts upon the project were assessed.

Health Impact Evaluation Methodology

Potential community risk impacts from TAC sources near the project site upon infants and children at the daycare facility were evaluated. This community risk assessment models concentrations of $PM_{2.5,}$ DPM, and total organic gases (TOG), which are then used to evaluate potential cancer risk and non-cancer health hazards.

Cancer Risks

A health risk assessment for exposure to TACs requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and CARB develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[4] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[5] This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. While the OEHHA guidelines use substantially more conservative assumptions than the current BAAQMD guidelines, BAAQMD has not formally adopted recommended procedures for applying the newest OEHHA guidelines. BAAQMD is in the process of developing new guidance and has provided initial information on exposure parameter values they are proposing for use.[6] The OEHHA guidelines and newly recommended BAAQMD exposure parameters were used in this evaluation.

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

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[4] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[5] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

[6] Email from Virginia Lau, BAAQMD to Bill Popenuck, dated November 15, 2015.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions.

Functionally, cancer risk is calculated using the following parameters and formulas;

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^{6}$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR \times A \times (EF/365) \times 10^{-6}$

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized in Table 1.

Table 1. Health Risk Parameters Used for Cancer Risk Calculations

Parameter	*Exposure Type* / *Age Range*	Infant		Child	Adult
		3rd Trimester	0<2	2 < 16	16 - 30
Cancer Potency Factors (mg/kg-day)$^{-1}$					
DPM		1.10E+00	1.10E+00	1.10E+00	1.10E+00
TOG Exhaust Emissions		6.28E-03	6.28E-03	6.28E-03	6.28E-03
TOG Evaporative Emissions		3.70E-04	3.70E-04	3.70E-04	3.70E-04
Daily Breathing Rate (L/kg-day)*		361	1,090	572	261
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14
Exposure Frequency (days/year)**		350	260	260	350
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home		1.0	1.0	1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults
** Daycare infant & child exposures assumed to occur for 5 days/week & 52 weeks/year

Non-Cancer Hazards

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. Typically, for projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is DPM. For DPM, the chronic inhalation REL is 5 $\mu g/m^3$. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

While not a TAC, $PM_{2.5}$ has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under CEQA. The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Operational Community Risk Impacts

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site. These sources include freeways or highways, busy surface streets and stationary sources identified by BAAQMD. A review of the area indicates that the Almaden Expressway and Redmond Avenue are roadways within 1,000 feet of the project site that could adversely affect infants and children at the new daycare facility. Based on a traffic impact study for the proposed project[7], the average daily traffic (ADT) on Redmond Avenue is about 4,930 vehicles, which is below the 10,000 vehicles criterion that the BAAQMD recommends assessing local roadways for project impacts. Therefore, Redmond Avenue is not analyzed further. Based on the BAAQMD's *Stationary Source Screening Analysis Tool*, which uses Google Earth map tools to identify the location of stationary sources and their estimated risk and hazard impacts, there is one stationary source within 1,000 feet of the project site, a Chevron gas station across from the project site on the northwest corner of Almaden Expressway and Redmond Avenue.[8]

There are thresholds that address both the impact of single-source and cumulative TAC sources upon projects that include new sensitive receptors. For this analysis, both single-source and cumulative TAC impacts were evaluated. A refined analysis is used to assess impacts from traffic on Almaden Expressway, while a screening analysis is used to assess impacts from the gas station.

Impacts from Almaden Expressway

Busy roadways are a source of TAC emissions that could affect new sensitive receptors at the project site. Almaden Expressway is a busy arterial roadway adjacent the project site. Based on data from Santa Clara County[9], Almaden Expressway north of the project site between Capitol Expressway and Redmond Avenue is a 6 lane road and has an ADT volume of 63,510. Almaden Expressway south of the project

[7] TJKM, 2015. *Traffic Impact Study for Proposed Daycare Center, 16601 Almaden Expressway Daycare Center, San Jose, CA.* November 17, 2015.
[8] See http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools , accessed December 16, 2015.
[9] Santa Clara County, 2015. *Official County Road Book 2015*. Revised 7/15.

site between Via Valiente and Redmond Avenue is a 4 lane road and has an ADT volume of 39,810. Truck volumes on Almaden Expressway were estimated based on the BAAQMD-recommended truck percentage of 3.51 percent for Santa Clara County. Approximately 67 percent of the truck traffic was assumed to be medium-duty trucks (i.e., delivery type trucks) and the remainder was assumed to be heavy-duty trucks.

The proposed new daycare facility would be between 30 feet and 140 feet from the edge of Almaden Expressway. Because these traffic volumes are greater than an ADT of 10,000 a refined analysis of Almaden Expressway to assess potential impacts to the project was conducted.

Almaden Expressway Vehicle Emissions

TAC emissions from traffic include DPM, particularly from trucks, and organic TAC compounds from gasoline-fuelled vehicles. As recommended by BAAQMD, total organic gas (TOG) emissions from vehicle exhaust and running evaporative losses from gasoline vehicles, which are considered organic TAC emissions, were used to evaluate cancer risks and non-cancer health effects.[10] Vehicle $PM_{2.5}$ emissions, which include exhaust emissions and $PM_{2.5}$ emissions generated from tire and brake wear and roadway dust, from all vehicles (diesel- and gasoline-fuelled) were also evaluated for potential health effects.

Emission factors for DPM ($PM_{2.5}$ exhaust from diesel vehicles), $PM_{2.5}$, and TOG were developed for the year 2017 using the calculated mix of cars and trucks on Almaden Expressway and CARB's EMFAC2014 vehicle emissions model. EMFAC2014 is the most recent version of the CARB motor vehicle emissions model. DPM emissions are projected to decrease in the future and are reflected in the EMFAC2014 emissions data. Default EMFAC2014 vehicle model year distributions for Santa Clara County were used in calculating emissions for 2017. Traffic volumes were assumed to increase 1 percent per year. Emissions were based on average vehicle speeds of 50 mph for off-peak hours and 15 mph for two-hour morning and evening peak periods.[11] Average hourly traffic volume distributions for Santa Clara County roadways were developed using the EMFAC model,[12] which were then applied to the average daily traffic volumes on Almaden Expressway to obtain estimated hourly traffic volumes and emissions. The $PM_{2.5}$ emissions calculated using EMFAC2014 include exhaust emissions from all vehicle types and emissions from tire and brake wear. $PM_{2.5}$ emissions of re-entrained roadway dust were calculated using CARB emission calculation procedures[13].

Use of the proposed daycare facility was assumed to begin in 2017 or thereafter. Year 2017 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated since, as discussed above, overall vehicle emissions and, in particular, diesel truck emissions will decrease in the future.

The hourly traffic distributions and DPM, $PM_{2.5}$ and TOG emission rates used in the analysis are shown in Attachment 1.

[10] BAAQMD, 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012.
[11] Santa Clara Valley Transportation Authority. *2012 Monitoring and Conformance Report.* May, 2012.
[12] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2011 does not include Burden type output with hour by hour traffic volume information.
[13] CARB, 2014. *Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust*. Revised and updated, April 2014.

Dispersion Modeling

Dispersion modeling of roadway TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA CAL3QHCR air quality dispersion model, which is recommended by the BAAQMD for this type of analysis.[14] The model used a five-year set (1991 - 1995) of hourly meteorological data from the Mineta San Jose International Airport prepared by the BAAQMD for use in modeling. TAC and $PM_{2.5}$ emissions from northbound and southbound traffic on Almaden Expressway within about 1,000 feet of the project site between 6:00 a.m. and 6:00 p.m. were included in the modeling. Other inputs to the model included road geometry, hourly traffic volumes, emission factors, and receptor locations. Concentrations were calculated at receptors within the proposed daycare facility using a grid of receptors spaced about every 4 meters (13 feet). Receptor heights of 1.0 meters (about 3.3 feet) were used for the modeling. The portions of Almaden Expressway included in the modeling are shown in Figure 1 along with the project site, proposed daycare building, and receptor locations where impacts were modeled.

Computed Community Risk Impacts

Maximum increased cancer risks were calculated for infants and children at the daycare facility using the maximum modeled TAC concentrations. A 12-year exposure period was used in calculating cancer risks assuming a child would attend the daycare facility from infancy to 12 years of age and would be at the facility for 12 hours per day, 5 days per week, for 52 weeks per year. The highest cancer risks occurred at the receptors closest to the Almaden Expressway. Cancer risks are greatest closest to Almaden Expressway and decrease with distance from the road. Figure 1 shows the location of maximum cancer risk at the project site. The maximum increased cancer risk was computed as 3.3 in one million. The predicted cancer risks at the daycare facility would be below the BAAQMD threshold of an increased cancer risk of greater than 10 in one million. *This would be considered a less than significant impact.*

For non-cancer health effects from DPM, the maximum chronic HI of 0.001 was computed based on an average DPM concentration of 0.006 $\mu g/m^3$ and a chronic inhalation REL for DPM is 5 $\mu g/m^3$. This HI is well below the BAAQMD HI threshold of greater than 1.0. *This would be considered a less than significant impact*.

$PM_{2.5}$ Concentrations from Almaden Expressway Traffic

The maximum annual average $PM_{2.5}$ concentration occurred at the same receptor that had the maximum cancer risk. The maximum average annual concentration was 0.2 $\mu g/m^3$ from Almaden Expressway traffic. This concentration is below the BAAQMD $PM_{2.5}$ threshold of a concentration greater than 0.3 $\mu g/m^3$. *This would be considered a less than significant impact.*

Emission rates and risk modeling calculations are provided in Attachment 1.

Stationary Source Impacts

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Stationary Source Screening Analysis Tool*. This mapping tool uses Google Earth to identify the location of stationary sources and their estimated risk and hazard impacts. The BAAQMD tool identified one source that could affect the project site.

Plant G11590 is a gas-dispensing facility located at 16455 Almaden Expressway, operated by Chevron #7075. The emission sources at the gas station are about 215 feet from the closest daycare facility receptor location. The gas station screening-level cancer risk is listed as 31.33 in one million and a HI of

[14] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012

0.052 for a full time exposure (24 hours/day, 350 days per year, for 70 years). There are no $PM_{2.5}$ emissions from this source. These maximum health impact values at or near the gas station boundary were adjusted for distance based on BAAQMD's *Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities (GDF)*[15]. According to the BAAQMD adjustment tool (adjusted for the 215-foot distance), this facility would result in an excess cancer risk of 5.4 per million, HI of <0.01, and no $PM_{2.5}$ concentration, all of which would be below BAAQMD thresholds of significance. Since the children at the daycare facility would not be at that location full time, potential impacts from the gas station would be much lower than indicated above. *This would be considered a less than significant impact.*

Summary of Combined Community Risk

As discussed above, the project site is affected by multiple sources of TACs. Table 2 shows the health risk impacts associated with each source affecting the project site. The sum of impacts from combined sources (i.e., sources within 1,000 feet of the project) would be below the BAAQMD thresholds of significance and, therefore, the combined impact from operational community risk at the project would be considered *less than significant*.

Table 2. Combined Community Risk Levels at Location of Maximum Impact

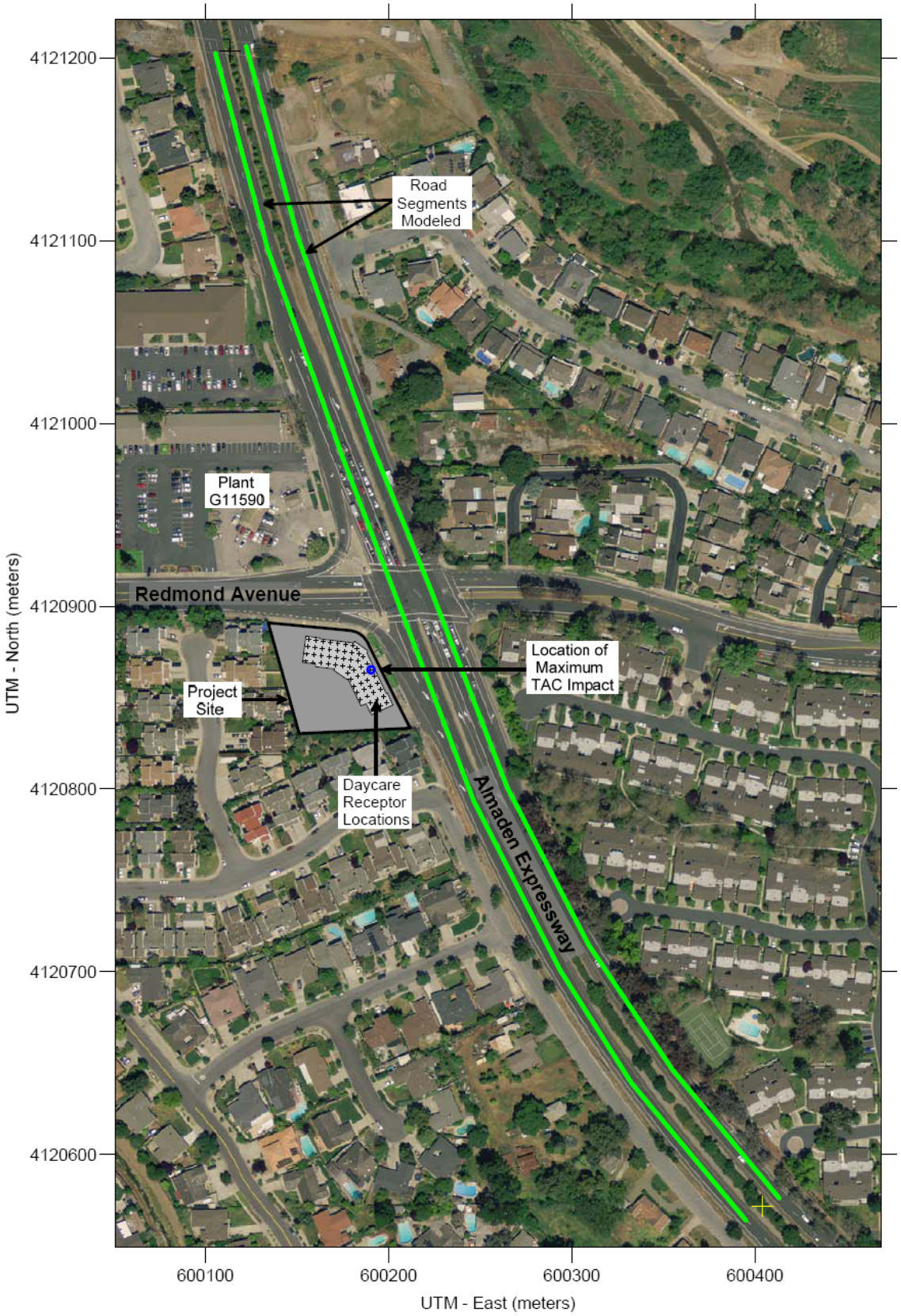
Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Chronic Hazard Index
Maximum Almaden Expressway	3.3	0.2	<0.01
Chevron #7075 Gas Station, Plant G11590	5.4	0.0	<0.01
Total	8.7	0.2	0.02
BAAQMD Cumulative Source Threshold	*100.0*	*0.8*	*10.0*
Significant?	***No***	***No***	***No***

Conclusion

The results of this Community Health Risk Assessment show that potential increased cancer and non-cancer health impacts to future residents of the proposed project from Almaden Expressway traffic and other nearby sources would be below significance thresholds established by the BAAQMD and would be a *less than significant* impact.

[15] Available at http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools

Figure 1. Project Site, Modeled Road Segments, and Location of Maximum TAC Impacts



Attachment 1 - Almaden Expressway Traffic Data and Health Risk Calculations

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - North Traffic Data and PM2.5 & TOG Emission Factors - 50 mph

Analysis Year = ***2017***

Vehicle Type	2014 Caltrans Number Vehicles (veh/day)	2017 Number Vehicles (veh/day)	2017 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	Emission Factors: All Vehicles Total PM2.5 (g/VMT)	Emission Factors: All Vehicles Exhaust PM2.5 (g/VMT)	Emission Factors: Gas Vehicles Exhaust TOG (g/VMT)	Emission Factors: Gas Vehicles Running TOG (g/VMT)
LDA	43,951	45,269	0.92%	415	50	0.0126	0.0190	0.0012	0.0201	0.055
LDT	17,320	17,840	0.15%	27	50	0.0174	0.0191	0.0013	0.0336	0.118
MDT	1,486	1,530	9.11%	139	50	0.0193	0.0259	0.0050	0.0586	0.192
HDT	743	765	89.99%	689	50	0.0559	0.1016	0.0514	0.2009	0.179
Total	63,500	65,405	-	1,270	50	-	-		-	-
Mix Avg Emission Factor						**0.03693**	**0.02013**	**0.00192**	**0.02488**	**0.07549**

Increase From 2014	1.03	
Vehicles/Direction	32,703	635
Avg Vehicles/Hour/Direction	**1,363**	**26**

Traffic Data Year = ***2014***

SCC-Official County Roadbood 2015		Total*	Truck by Axle			
	Total	Truck	2	3	4	5
Almaden between	63,500	2,229	1,486	248	248	248
Capitol Expressway & Redmond Ave			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		3.51%	2.34%	0.39%	0.39%	0.39%

* Truck percentage based on BAAQMD for trucks in Santa Clara Co. on non-state highways

Traffic Increase per Year (%) = ***1.00%***

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - North Traffic Data and PM2.5 & TOG Emission Factors - 15 mph

Analysis Year = ***2017***

Vehicle Type	2014 Caltrans Number Vehicles (veh/day)	2017 Number Vehicles (veh/day)	2017 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	Emission Factors: All Vehicles Total PM2.5 (g/VMT)	Emission Factors: All Vehicles Exhaust PM2.5 (g/VMT)	Emission Factors: Gas Vehicles Exhaust TOG (g/VMT)	Emission Factors: Gas Vehicles Running TOG (g/VMT)
LDA	43,951	45,269	0.92%	415	15	0.0314	0.0223	0.0046	0.0737	0.055
LDT	17,320	17,840	0.15%	27	15	0.0437	0.0226	0.0049	0.1181	0.118
MDT	1,486	1,530	9.11%	139	15	0.0496	0.0414	0.0206	0.2231	0.192
HDT	743	765	89.99%	689	15	0.1389	0.1680	0.1178	0.6019	0.179
Total	63,500	65,405	-	1,270	15	-	-	-	-	-
Mix Avg Emission Factor						**0.09196**	**0.02455**	**0.00635**	**0.08988**	**0.07549**

Increase From 2014	1.03	
Vehicles/Direction	32,703	635
Avg Vehicles/Hour/Direction	**1,363**	**26**

Traffic Data Year = ***2014***

SCC-Official County Roadbood 2015		Total*	Truck by Axle			
	Total	Truck	2	3	4	5
Almaden between	63,500	2,229	1,486	248	248	248
Capitol Expressway & Redmond Ave			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		3.51%	2.34%	0.39%	0.39%	0.39%

* Truck percentage based on BAAQMD for trucks in Santa Clara Co. on non-state highways

Traffic Increase per Year (%) = ***1.00%***

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - North Traffic Data and Entrained PM2.5 Road Dust Emission Factors

$E_{2.5} = [k(sL)^{0.91} \times (W)^{1.02} \times (1-P/4N) \times 453.59$

where:

$E_{2.5} = PM_{2.5}$ emission factor (g/VMT)

k = particle size multiplier (g/VMT) [$k_{PM2.5} = k_{PM10}$ x (0.0686/0.4572) = 1.0 x 0.15 = 0.15 g/VMT][a]

sL = roadway specific silt loading (g/m^2)

W = average weight of vehicles on road (Bay Area default = 2.4 tons)[a]

P = number of days with at least 0.01 inch of precipitation in the annual averaging period

N = number of days in the annual averaging period (default = 365)

Notes: [a] CARB 2014, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust (Revised and updated, April 2014)

Road Type	Silt Loading (g/m^2)	Average Weight (tons)	County	No. Days ppt > 0.01"	$PM_{2.5}$ Emission Factor (g/VMT)
Major	0.032	2.4	Santa Clara	64	0.01528

SFBAAB[a]

Road Type	Silt Loading (g/m^2)
Collector	0.032
Freeway	0.02
Local	0.32
Major	0.032

SFBAAB[a]

County	>0.01 inch precipitation
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - North
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2017

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB-N_ALMA	Northbound N Almaden	N	3	315	56	17.0	3.4	635	variable
SB-N_ALMA	Southbound N Almaden	S	3	315	56	17.0	3.4	635	variable

2017 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	6.36%	40	0.0925	17	5.71%	36	0.0921
2	0.00%	0	0.0000	10	6.89%	44	0.0391	18	4.44%	28	0.0687
3	0.00%	0	0.0000	11	6.27%	40	0.0377	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	6.63%	42	0.0384	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.08%	39	0.0380	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.10%	39	0.0375	22	0.00%	0	0.0000
7	5.99%	38	0.0406	15	5.42%	34	0.0364	23	0.00%	0	0.0000
8	5.16%	33	0.0893	16	4.63%	29	0.0326	24	0.00%	0	0.0000
								Total		443	

2017 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	6.36%	40	0.0925	17	5.71%	36	0.0921
2	0.00%	0	0.0000	10	6.89%	44	0.0391	18	4.44%	28	0.0687
3	0.00%	0	0.0000	11	6.27%	40	0.0377	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	6.63%	42	0.0384	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.08%	39	0.0380	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.10%	39	0.0375	22	0.00%	0	0.0000
7	5.99%	38	0.0406	15	5.42%	34	0.0364	23	0.00%	0	0.0000
8	5.16%	33	0.0893	16	4.63%	29	0.0326	24	0.00%	0	0.0000
								Total		443	

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - North
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2017

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-N_ALMA	Northbound N Almaden	N	3	315	56	17.0	1.3	32,703	variable
SB-N_ALMA	Southbound N Almaden	S	3	315	56	17.0	1.3	32,703	variable

2017 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	2314	0.0248	17	7.39%	2417	0.0241
2	0.00%	0	0.0000	10	4.27%	1396	0.0210	18	8.29%	2711	0.0236
3	0.00%	0	0.0000	11	4.60%	1504	0.0205	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1911	0.0204	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	2018	0.0201	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1973	0.0202	22	0.00%	0	0.0000
7	3.76%	1231	0.0207	15	7.08%	2315	0.0199	23	0.00%	0	0.0000
8	7.91%	2585	0.0237	16	7.23%	2363	0.0197	24	0.00%	0	0.0000
								Total		24,738	

2017 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	2314	0.0248	17	7.39%	2417	0.0241
2	0.00%	0	0.0000	10	4.27%	1396	0.0210	18	8.29%	2711	0.0236
3	0.00%	0	0.0000	11	4.60%	1504	0.0205	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1911	0.0204	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	2018	0.0201	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1973	0.0202	22	0.00%	0	0.0000
7	3.76%	1231	0.0207	15	7.08%	2315	0.0199	23	0.00%	0	0.0000
8	7.91%	2585	0.0237	16	7.23%	2363	0.0197	24	0.00%	0	0.0000
								Total		24,738	

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - North
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2017

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-N_ALMA	Northbound N Almaden	N	3	315	56	17.0	1.3	32,703	variable
SB-N_ALMA	Southbound N Almaden	S	3	315	56	17.0	1.3	32,703	variable

2017 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	2314	0.0153	17	7.39%	2417	0.0153
2	0.00%	0	0.0000	10	4.27%	1396	0.0153	18	8.29%	2711	0.0153
3	0.00%	0	0.0000	11	4.60%	1504	0.0153	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1911	0.0153	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	2018	0.0153	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1973	0.0153	22	0.00%	0	0.0000
7	3.76%	1231	0.0153	15	7.08%	2315	0.0153	23	0.00%	0	0.0000
8	7.91%	2585	0.0153	16	7.23%	2363	0.0153	24	0.00%	0	0.0000
								Total		24,738	

2017 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	2314	0.0153	17	7.39%	2417	0.0153
2	0.00%	0	0.0000	10	4.27%	1396	0.0153	18	8.29%	2711	0.0153
3	0.00%	0	0.0000	11	4.60%	1504	0.0153	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1911	0.0153	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	2018	0.0153	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1973	0.0153	22	0.00%	0	0.0000
7	3.76%	1231	0.0153	15	7.08%	2315	0.0153	23	0.00%	0	0.0000
8	7.91%	2585	0.0153	16	7.23%	2363	0.0153	24	0.00%	0	0.0000
								Total		24,738	

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - South Traffic Data and PM2.5 & TOG Emission Factors - 50 mph

Analysis Year = ***2017***

Vehicle Type	2014 Caltrans Number Vehicles (veh/day)	2017 Number Vehicles (veh/day)	2017 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	All Vehicles: Total PM2.5 (g/VMT)	All Vehicles: Exhaust PM2.5 (g/VMT)	Gas Vehicles: Exhaust TOG (g/VMT)	Gas Vehicles: Running TOG (g/VMT)
LDA	27,547	28,373	0.92%	260	50	0.0126	0.0190	0.0012	0.0201	0.055
LDT	10,856	11,182	0.15%	17	50	0.0174	0.0191	0.0013	0.0336	0.118
MDT	931	959	9.11%	87	50	0.0193	0.0259	0.0050	0.0586	0.192
HDT	466	480	89.99%	432	50	0.0559	0.1016	0.0514	0.2009	0.179
Total	39,800	40,994	-	796	50	-	-		-	-
Mix Avg Emission Factor						**0.03693**	**0.02013**	**0.00192**	**0.02488**	**0.07549**

Increase From 2014	1.03		
Vehicles/Direction	20,497	398	
Avg Vehicles/Hour/Direction	**854**	**17**	

Traffic Data Year = ***2014***

SCC-Official County Roadbood 2015	Total	Total* Truck	Truck by Axle: 2	3	4	5
Almaden between	39,800	1,397	931	155	155	155
Redmond Ave & Via Valiente			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		3.51%	2.34%	0.39%	0.39%	0.39%

* Truck percentage based on BAAQMD for trucks in Santa Clara Co. on non-state highways

Traffic Increase per Year (%) = ***1.00%***

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - South Traffic Data and PM2.5 & TOG Emission Factors - 15 mph

Analysis Year = ***2017***

Vehicle Type	2014 Caltrans Number Vehicles (veh/day)	2017 Number Vehicles (veh/day)	2017 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	All Vehicles: Total PM2.5 (g/VMT)	All Vehicles: Exhaust PM2.5 (g/VMT)	Gas Vehicles: Exhaust TOG (g/VMT)	Gas Vehicles: Running TOG (g/VMT)
LDA	27,547	28,373	0.92%	260	15	0.0314	0.0223	0.0046	0.0737	0.055
LDT	10,856	11,182	0.15%	17	15	0.0437	0.0226	0.0049	0.1181	0.118
MDT	931	959	9.11%	87	15	0.0496	0.0414	0.0206	0.2231	0.192
HDT	466	480	89.99%	432	15	0.1389	0.1680	0.1178	0.6019	0.179
Total	39,800	40,994	-	796	15	-	-	-	-	-
Mix Avg Emission Factor						**0.09196**	**0.02455**	**0.00635**	**0.08988**	**0.07549**

Increase From 2014	1.03		
Vehicles/Direction	20,497	398	
Avg Vehicles/Hour/Direction	**854**	**17**	

Traffic Data Year = ***2014***

SCC-Official County Roadbood 2015	Total	Total* Truck	Truck by Axle: 2	3	4	5
Almaden between	39,800	1,397	931	155	155	155
Redmond Ave & Via Valiente			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		3.51%	2.34%	0.39%	0.39%	0.39%

* Truck percentage based on BAAQMD for trucks in Santa Clara Co. on non-state highways

Traffic Increase per Year (%) = ***1.00%***

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - South
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2017

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB-N_ALMA	Northbound N Almaden	N	2	386	44	13.3	3.4	398	variable
SB-N_ALMA	Southbound N Almaden	S	2	393	44	13.3	3.4	398	variable

2017 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	6.36%	25	0.0925	17	5.71%	23	0.0921
2	0.00%	0	0.0000	10	6.89%	27	0.0391	18	4.44%	18	0.0687
3	0.00%	0	0.0000	11	6.27%	25	0.0377	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	6.63%	26	0.0384	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.08%	24	0.0380	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.10%	24	0.0375	22	0.00%	0	0.0000
7	5.99%	24	0.0406	15	5.42%	22	0.0364	23	0.00%	0	0.0000
8	5.16%	21	0.0893	16	4.63%	18	0.0326	24	0.00%	0	0.0000
								Total		277	

2017 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	6.36%	25	0.0925	17	5.71%	23	0.0921
2	0.00%	0	0.0000	10	6.89%	27	0.0391	18	4.44%	18	0.0687
3	0.00%	0	0.0000	11	6.27%	25	0.0377	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	6.63%	26	0.0384	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.08%	24	0.0380	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.10%	24	0.0375	22	0.00%	0	0.0000
7	5.99%	24	0.0406	15	5.42%	22	0.0364	23	0.00%	0	0.0000
8	5.16%	21	0.0893	16	4.63%	18	0.0326	24	0.00%	0	0.0000
								Total		277	

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - South
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2017

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-N_ALMA	Northbound N Almaden	N	2	386	44	13.3	1.3	20,497	variable
SB-N_ALMA	Southbound N Almaden	S	2	393	44	13.3	1.3	20,497	variable

2017 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	1450	0.0248	17	7.39%	1515	0.0241
2	0.00%	0	0.0000	10	4.27%	875	0.0210	18	8.29%	1699	0.0236
3	0.00%	0	0.0000	11	4.60%	943	0.0205	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1197	0.0204	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	1265	0.0201	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1237	0.0202	22	0.00%	0	0.0000
7	3.76%	772	0.0207	15	7.08%	1451	0.0199	23	0.00%	0	0.0000
8	7.91%	1620	0.0237	16	7.23%	1481	0.0197	24	0.00%	0	0.0000
								Total		15,505	

2017 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	1450	0.0248	17	7.39%	1515	0.0241
2	0.00%	0	0.0000	10	4.27%	875	0.0210	18	8.29%	1699	0.0236
3	0.00%	0	0.0000	11	4.60%	943	0.0205	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1197	0.0204	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	1265	0.0201	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1237	0.0202	22	0.00%	0	0.0000
7	3.76%	772	0.0207	15	7.08%	1451	0.0199	23	0.00%	0	0.0000
8	7.91%	1620	0.0237	16	7.23%	1481	0.0197	24	0.00%	0	0.0000
								Total		15,505	

Kiddie Acadmy, 16601 Almaden Expressway, San Jose, CA
Almaden Expressway - South
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2017

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-N_ALMA	Northbound N Almaden	N	2	386	44	13.3	1.3	20,497	variable
SB-N_ALMA	Southbound N Almaden	S	2	393	44	13.3	1.3	20,497	variable

2017 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	1450	0.0153	17	7.39%	1515	0.0153
2	0.00%	0	0.0000	10	4.27%	875	0.0153	18	8.29%	1699	0.0153
3	0.00%	0	0.0000	11	4.60%	943	0.0153	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1197	0.0153	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	1265	0.0153	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1237	0.0153	22	0.00%	0	0.0000
7	3.76%	772	0.0153	15	7.08%	1451	0.0153	23	0.00%	0	0.0000
8	7.91%	1620	0.0153	16	7.23%	1481	0.0153	24	0.00%	0	0.0000
								Total		15,505	

2017 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB-N_ALMA

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.00%	0	0.0000	9	7.08%	1450	0.0153	17	7.39%	1515	0.0153
2	0.00%	0	0.0000	10	4.27%	875	0.0153	18	8.29%	1699	0.0153
3	0.00%	0	0.0000	11	4.60%	943	0.0153	19	0.00%	0	0.0000
4	0.00%	0	0.0000	12	5.84%	1197	0.0153	20	0.00%	0	0.0000
5	0.00%	0	0.0000	13	6.17%	1265	0.0153	21	0.00%	0	0.0000
6	0.00%	0	0.0000	14	6.03%	1237	0.0153	22	0.00%	0	0.0000
7	3.76%	772	0.0153	15	7.08%	1451	0.0153	23	0.00%	0	0.0000
8	7.91%	1620	0.0153	16	7.23%	1481	0.0153	24	0.00%	0	0.0000
								Total		15,505	

Kiddie Academy, San Jose, CA - Almaden Expressway DPM, PM2.5 & TOG TACs
CAL3QHCR Risk Modeling Parameters and Maximum Concentrations
Infant/Child Exposures: 1 - 12 years of age

Receptor Information

Number of Receptors	58
Receptor Heights =	1.0 meter
Receptor distances =	4 meter grid

Meteorological Conditions

BAAQMD San Jose Arpt Hourly Met Data	1991-1995
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations - Receptor Height = 1.5 m

Meteorological Data Year	DPM Concentration ($\mu g/m^3$) 2020	Gas Veh Exhaust TOG Concentration ($\mu g/m^3$) 2020	Gas Veh Evaporative TOG Concentration ($\mu g/m^3$) 2020
1991	0.0055	0.2475	0.4283
1992	0.0059	0.2611	0.4518
1993	0.0059	0.2621	0.4536
1994	0.0061	0.2734	0.4731
1995	0.0057	0.2533	0.4384
Average	**0.0058**	**0.2595**	**0.4490**
Maximum	**0.0061**	**0.2734**	**0.4731**

PM2.5 Concentrations

Meteorological Data Year	Maximum Total PM2.5 Concentration (µg/m3) 2020	Maximum Road Dust PM2.5 Concentration (µg/m3) 2020	Maximum Vehicle PM2.5 Concentration (µg/m3) 2020
1991	0.2053	0.0840	0.1213
1992	0.2164	0.0884	0.1280
1993	0.2173	0.0888	0.1285
1994	0.2266	0.0926	0.1340
1995	0.2099	0.0857	0.1242
Average	**0.2**	**0.1**	**0.1**
Maximum	**0.2**	**0.1**	**0.1**

Notes:

Maximum DPM & PM2.5 concentrations occur at receptors in the daycare facility closest to Almaden Expressway

Kiddie Academy, San Jose, CA - Almaden Expressway Cancer Risks
On-Site Receptors - 1.0 meter Receptor Heights
Infant/Child Exposures: 1 - 12 years of age

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group

ED = Exposure duration (years)

AT = Averaging time for lifetime cancer risk (years)

FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF** =	350	260	260	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

** Daycare infant & child exposures for 5 days/week & 52 weeks/year

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
					Annual Conc (ug/m3)						
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	DPM	TOG Exhaust	TOG Evaporative	DPM	TOG Exhaust	TOG Evaporative	Total
0	2018	0.25	-0.25 - 0*	10	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.00
1	2018	1	1	10	0.0058	0.2595	0.4490	0.71	0.181	0.018	0.91
2	2019	1	2	10	0.0058	0.2595	0.4490	0.71	0.181	0.018	0.91
3	2020	1	3	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.14
4	2021	1	4	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.14
5	2022	1	5	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.14
6	2023	1	6	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.14
7	2024	1	7	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.143
8	2025	1	8	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.143
9	2026	1	9	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.143
10	2027	1	10	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.143
11	2028	1	11	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.143
12	2029	1	12	3	0.0058	0.2595	0.4490	0.11	0.028	0.003	0.143
13	2030	1	13	3	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
14	2031	1	14	3	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
15	2032	1	15	3	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
16	2033	1	16	3	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
17	2034	1	17	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
18	2035	1	18	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
19	2036	1	19	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
20	2037	1	20	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
21	2038	1	21	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
22	2039	1	22	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
23	2040	1	23	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
24	2041	1	24	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
25	2042	1	25	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
26	2043	1	26	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
27	2044	1	27	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
28	2045	1	28	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
29	2046	1	29	1	0.0000	0.0000	0.0000	0.00	0.000	0.000	0.000
Total Increased Cancer Risk								**2.5**	**0.6**	**0.1**	**3.3**

* Third trimester of pregnancy

BAAQMD Stationary Source Screening Analysis Tool Data for:

G11590

Santa_Clara_May_2012_schema:FID	593
Santa_Clara_May_2012_schema:PlantNo	G11590
Santa_Clara_May_2012_schema:Name	Chevron #7075
Santa_Clara_May_2012_schema:Address	16455 Almaden Expy
Santa_Clara_May_2012_schema:City	San Jose
Santa_Clara_May_2012_schema:UTM_East	600151.696673
Santa_Clara_May_2012_schema:UTM_North	4120957.80254
Santa_Clara_May_2012_schema:Cancer	31.326
Santa_Clara_May_2012_schema:Hazard	0.052
Santa_Clara_May_2012_schema:PM25	Na

How to Use the Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities (GDF)

This distance multiplier tool refines the screening values for cancer risk and chronic hazard index found in the District's Stationary Source Screening Analysis Tool to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions (GDF's).

1. Obtain the GDF cancer risk and/or chronic hazard index from the District's Stationary Source Screening Analysis tool for facilities where the Plant No. is preceded with a 'G'. If the distance to the nearest receptor is less than 20 meters, the distance adjustment multiplier table cannot be used and an air dispersion modeling analysis using site-specific information is needed to refine the cancer risk and/or chronic hazard index estimate.

2. Determine the shortest distance from the GDF to the nearest receptor.

3. In the table below, enter the cancer risk and/or chronic hazard index found in step 1 for the GDF in the row which aligns with the shortest distance from each GDF to the nearest receptor (found in step 2). If the shortest distance to the receptor falls between two distance values, select the multiplier corresponding to the smaller distance. For distances beyond 300 meters, use the multiplier 0.015. The resulting product is the adjusted cancer risk in a million or the adjusted chronic hazard index for the GDF.

Note: These distance adjustment multipliers may be used only for the screening level health risk values indicated in the District's Stationary Source Screening Analysis tool for gasoline dispensing facilities. This distance multiplier tool may not be used to adjust values from an HRA if an HRA for the facility was conducted.

Distance meters	Distance feet	Distance adjustment multiplier	Enter Cancer Risk	Adjusted Cancer Risk	Enter Chronic Hazard Index	Adjusted Chronic Hazard Index
20	66	1.000		0		0
25	82	0.728		0		0
30	98	0.559		0		0
35	115	0.445		0		0
40	131	0.365		0		0
45	148	0.305		0		0
50	164	0.260		0		0
55	180	0.225		0		0
60	197	0.197		0		0
65	213	0.174	31.326	5.44	0.052	0.009
70	230	0.155		0		0
75	246	0.139		0		0
80	262	0.126		0		0
85	279	0.114		0		0
90	295	0.104		0		0
95	312	0.096		0		0
100	328	0.088		0		0